Section 1

CARIES

Dental caries is the single most common chronic disease of childhood (Edelstein & Douglass, 1995; US DHHS, 2000). However, in recent years, dental caries has declined dramatically among children as a result of various preventive regimens, including community water fluoridation and increased use of toothpastes and fluoride rinses (Kaste et al., 1996). Since the 1970s, there has been a 57.2% decrease in decayed, missing, and filled teeth (DMFT) and a 58.8% decrease in decayed, missing, and filled surfaces (DMFS) in permanent teeth among 6- to 18-year-olds (Brown et al., 2000a). However, despite the reduction, dental caries remains a significant problem in some populations, particularly certain racial and ethnic groups, and among poor children.

Untreated dental decay can lead to extensive dental treatment, tooth pain, abscess, and possible tooth loss (US DHHS, 2000). The percentage of persons with untreated dental decay varies by poverty status and race/ethnicity. At all ages, those living below the poverty level were more likely to have untreated dental decay than those living at or above the poverty level (US DHHS, 2000). Adult non-Hispanic blacks and Mexican Americans were shown to have a higher proportion of untreated decay than non-Hispanic whites (US DHHS, 2000; Brown et al., 2000b).

This section presents the following indicators: untreated dental caries prevalence among children (ages 2-4 and 6-8 years), adolescents (ages 12-15 years), and adults (ages 35-44 years); dental caries severity among children, adolescents, and adults; and trends in untreated dental caries prevalence among children, adolescents, and adults.

REFERENCES

Brown LJ, Wall TP, Lazar V. Trends in untreated caries in primary teeth of children 2 to 10 years old. J Am Dent Assoc 2000a;131:93-100.

Brown LJ, Wall TP, Lazar V. Trends in total caries experience: permanent and primary teeth. J Am Dent Assoc 2000b;131(2):223-31.

Edelstein BL, Douglass C. Dispelling the myth that 50 percent of the U.S. schoolchildren have never had a cavity. Public Health Reports 1995;110(5):522-30.

Kaste LM, Selwitz RH, Oldakowski JA, Winn DM, Brown LJ. Coronal caries in the primary and permanent dentition of children and adolescents 1-17 years of age: United States, 1988-1991. J Dent Res 1996;75(Spec Iss):631-41.

U.S. Department of Health and Human Services. *Oral Health in America: A Report of the Surgeon General*. Rockville, MD: U.S. Department of Health and Human Services, National Institute of Dental and Craniofacial Research, National Institutes of Health, 2000.

1.1 Untreated dental caries prevalence among children (2-4 and 6-8 years old), adolescents (12-15 years old), and adults (35-44 years old)

Results from NHANES III indicated that among children 16.3% of those aged 2-4 years and 28.5% of those aged 6-8 years had untreated dental caries while among adolescents 17.9% of those aged 12-15 years had untreated dental caries. Differences in untreated caries prevalence by race/ethnicity and poverty were greatest at the younger age groups and least among those aged 12-15 years. Mexican Americans experienced the highest prevalence of untreated decay among children and adolescents, but non-Hispanic blacks experienced the highest prevalence of untreated decay among adults. There were no gender differences in any age group. Persons of all ages living below the federal poverty level experienced a greater prevalence of untreated decay than those living above the federal poverty level. The percentage of the population with untreated caries was smaller among persons with higher educational levels.

In the following analyses untreated dental caries is assessed as a prevalence, individuals either had or did not have one or more decayed teeth at the time of the examination.

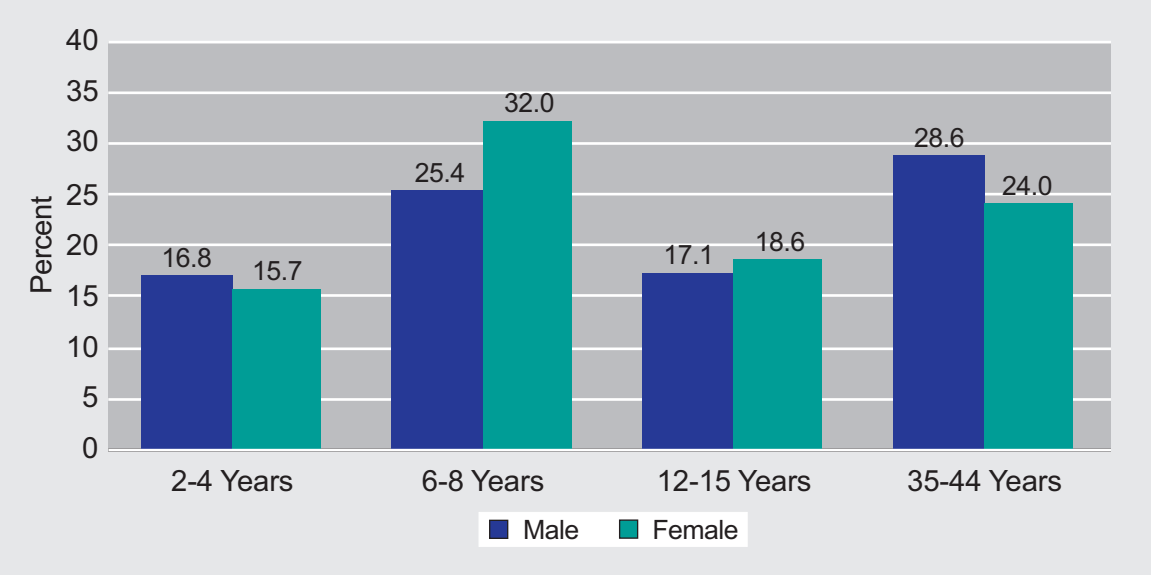
SOURCE OF DATA

The analyses reported here are based on the Third National Health and Nutrition Examination Survey (NHANES III) 1988-1994, National Center for Health Statistics, Centers for Disease Control and Prevention.

- **Untreated caries prevalence differences by gender and age group (Figure 1.1.1)**
  - All age groups showed similar prevalences by gender.
  - Among children and adolescents, those aged 6-8 years had the highest prevalence of untreated dental caries.
- **Untreated caries prevalence differences by federal poverty level and race/ethnicity by age group (Figure 1.1.2)**
  - Among children and adolescents at or above the federal poverty level the prevalence of untreated decay was lower among non-Hispanic whites than other racial/ethnic groups. At ages 2-4 years and 6-8 years, among those at or above the federal poverty level, Mexican Americans had the highest prevalence of untreated decay. However, at ages 12-15 and 35-44 years non-Hispanic blacks had the highest prevalence of untreated decay.
  - Among those living below the federal poverty level Mexican American children aged 2-4, 6-8, and 12-15 years showed the highest prevalences of untreated decay while adults aged 35-44 years displayed similar prevalences among the racial/ethnic groups.
- **Untreated caries prevalence differences by education and age group (Figure 1.1.3)**
  - At all ages the highest prevalence of untreated decay was among persons whose head of household (or the individual if an adult) had less than 12 years of education and lowest among those with more than a 12th grade education.

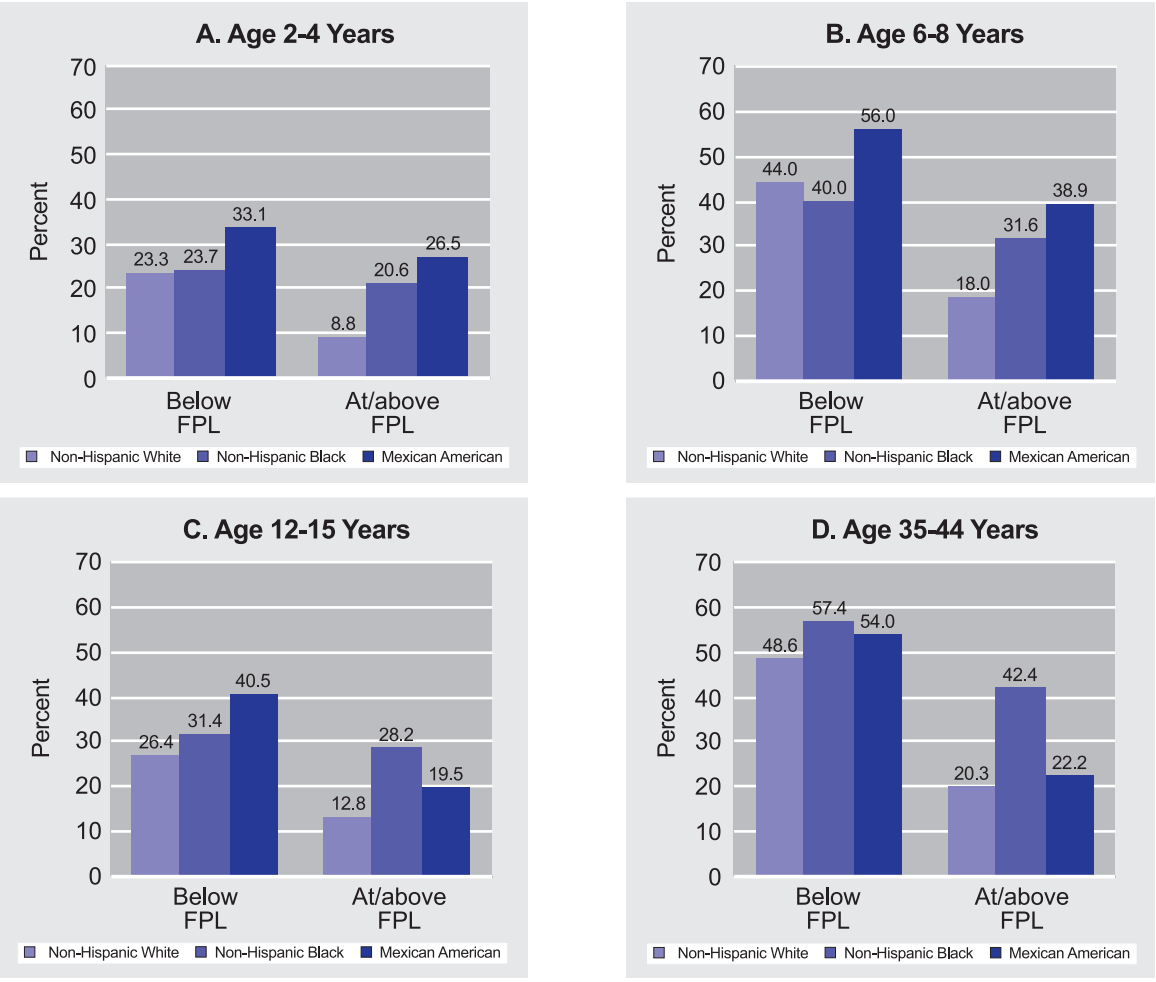
Bullets reference data that can be found in Table 1.1.1.

Figure 1.1.1. Untreated caries prevalence by gender and age group



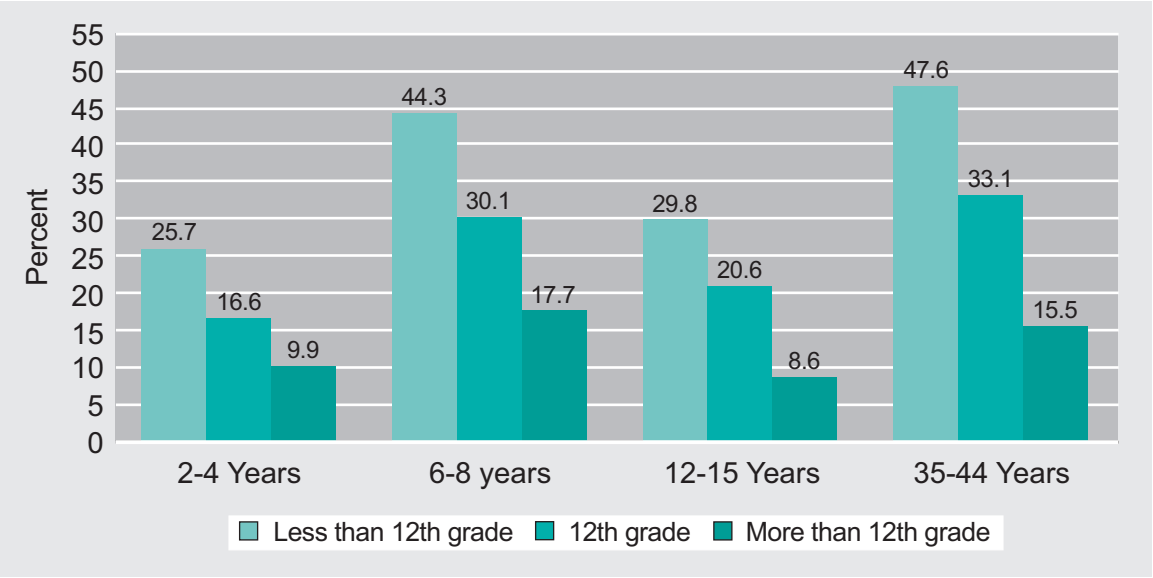
Data source: The Third National Health and Nutrition Examination Survey (NHANES III) 1988-1994, National Center for Health Statistics, Centers for Disease Control and Prevention.

Figure 1.1.2. Untreated caries prevalence by federal poverty level (FPL) and race/ethnicity by age group



Data source: The Third National Health and Nutrition Examination Survey (NHANES III) 1988-1994, National Center for Health Statistics, Centers for Disease Control and Prevention.

Figure 1.1.3. Untreated caries prevalence by education* and age group



*For children and adolescents education represents the educational attainment of the head of household. For adults education represents the educational attainment of the individual.

Data source: The Third National Health and Nutrition Examination Survey (NHANES III) 1988-1994, National Center for Health Statistics, Centers for Disease Control and Prevention.

1.2 Dental caries severity—decayed, missing, and filled tooth surfaces (DMFS/dfs) among children (2-4 and 6-8 years old), adolescents (12-15 years old), and adults (35-44 years old)

Results from NHANES III indicated that the mean DMFS (permanent teeth) among children aged 6-8 years was 0.3 while the mean DMFS was 4.5 among adolescents aged 12-15 years and 42.5 among adults aged 35-44 years. Among racial/ethnic groups, Mexican American adults had the lowest mean DMFS compared to non-Hispanic whites and non-Hispanic blacks. There were no differences between those living below or at/above the federal poverty level for any age group.

The mean dfs (primary teeth) was 1.4 among those aged 2-4 years and 4.0 among those aged 6-8 years. In both age groups the mean dfs was highest among Mexican Americans and among persons living below the federal poverty level.

In these analyses, dental caries severity was measured by the cumulative indices DMFS for permanent teeth and dfs for primary teeth where the index components were decayed (D/d), missing (M), and filled (F/f) surfaces.

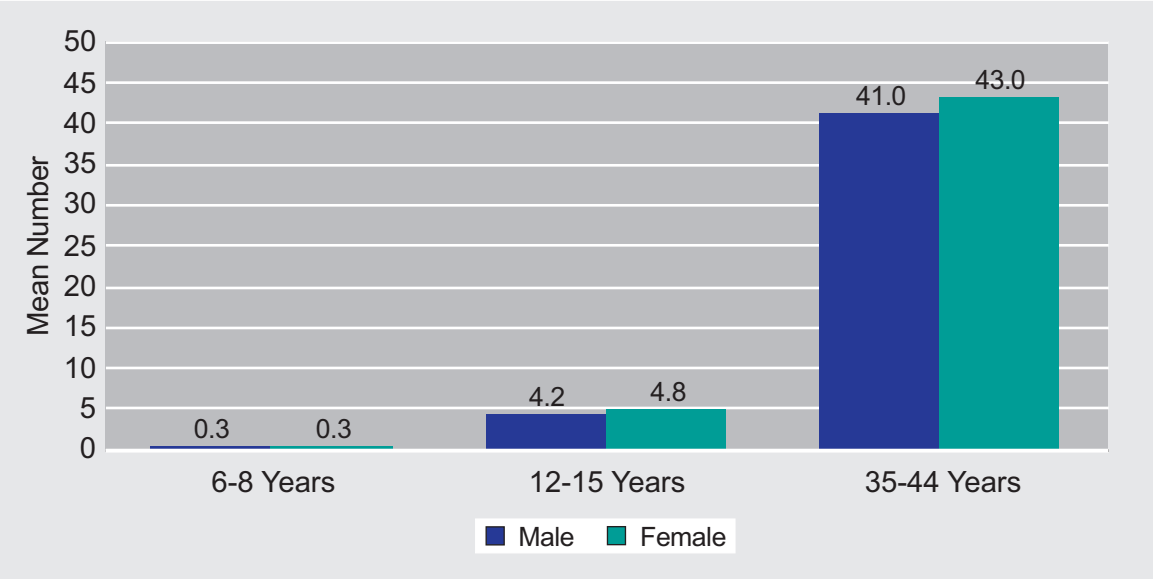
SOURCE OF DATA

The analyses reported here are based on the Third National Health and Nutrition Examination Survey (NHANES III) 1988-1994, National Center for Health Statistics, Centers for Disease Control and Prevention.

- **DMFS by age group and gender (Figure 1.2.1)**
  - The mean DMFS was similar for males and females in each age group.
- **DMFS by age group and race/ethnicity (Figure 1.2.2)**
  - The mean DMFS was lower among adult Mexican Americans aged 35-44 compared to non-Hispanic whites and non-Hispanic blacks. For the other age groups, the mean DMFS was similar among the racial/ethnic groups.
- **DMFS by age group and federal poverty level (Figure 1.2.3)**
  - The mean DMFS for each age group did not vary by federal poverty level.
- **dfs by age group and gender (Figure 1.2.4)**
  - The mean dfs did not vary by gender for either of the age groups.
- **dfs by age group and race/ethnicity (Figure 1.2.5)**
  - The mean dfs was greater for Mexican Americans compared to non-Hispanic whites and non-Hispanic blacks among 2- to 4-year-olds. Also, the mean dfs was greater for Mexican Americans than for non-Hispanic whites among 6- to 8-year-olds.
- **dfs by age group and federal poverty level (Figure 1.2.6)**
  - The mean dfs was higher among persons living below the federal poverty level for persons 2-4 and 6-8 years old.

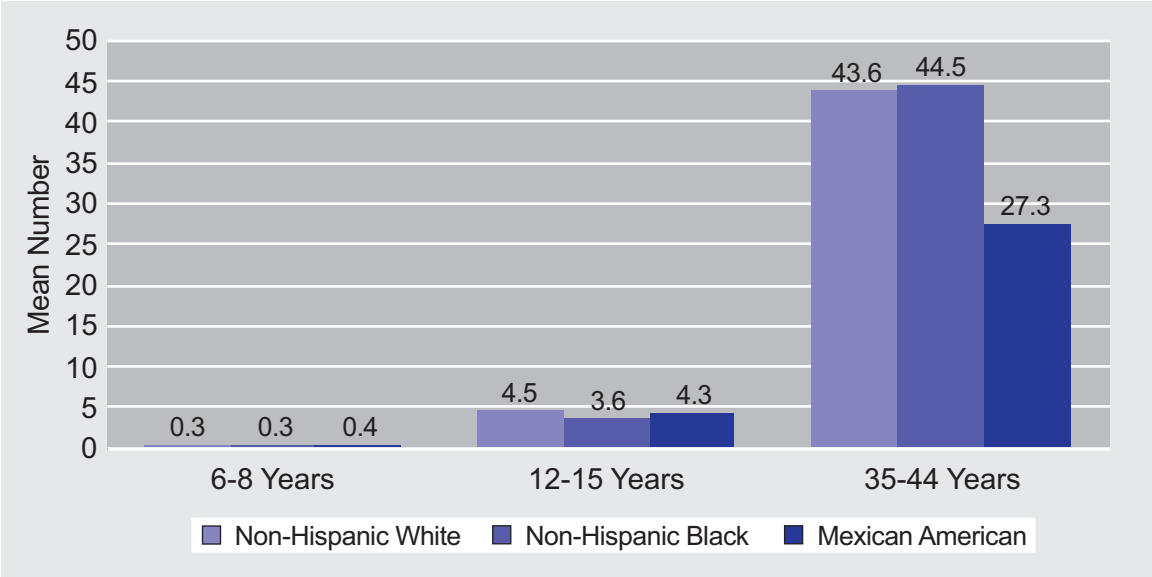
Bullets reference data that can be found in Tables 1.2.1 and 1.2.2.

Figure 1.2.1. Decayed, missing, and filled surfaces in permanent teeth (DMFS) by age group (ages 6-8, 12-15, and 35-44 years) and gender



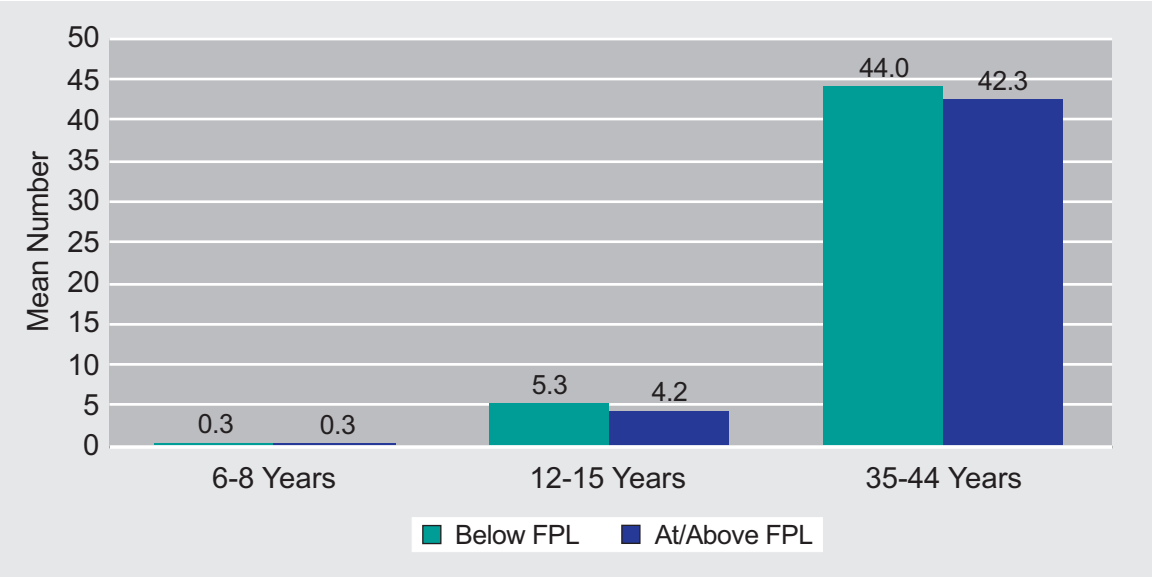
Data source: The Third National Health and Nutrition Examination Survey (NHANES III) 1988-1994, National Center for Health Statistics, Centers for Disease Control and Prevention.

Figure 1.2.2. Decayed, missing, and filled surfaces in permanent teeth (DMFS) by age group (ages 6-8, 12-15, and 35-44 years) and race/ethnicity



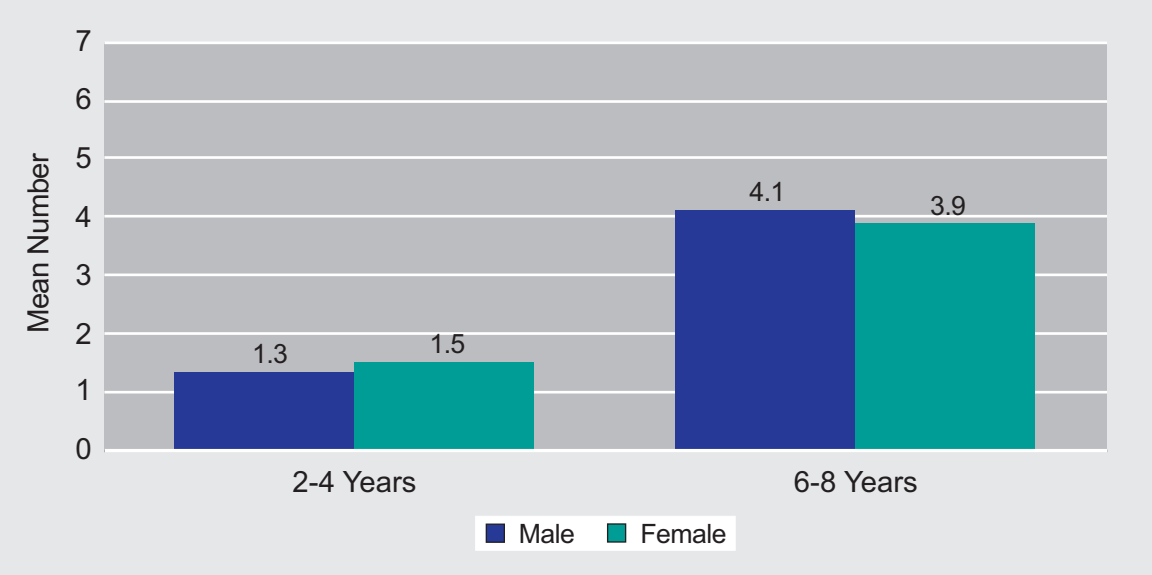
Data source: The Third National Health and Nutrition Examination Survey (NHANES III) 1988-1994, National Center for Health Statistics, Centers for Disease Control and Prevention.

Figure 1.2.3. Decayed, missing, and filled surfaces in permanent teeth (DMFS) by age group (ages 6-8, 12-15, and 35-44 years) and federal poverty level (FPL)



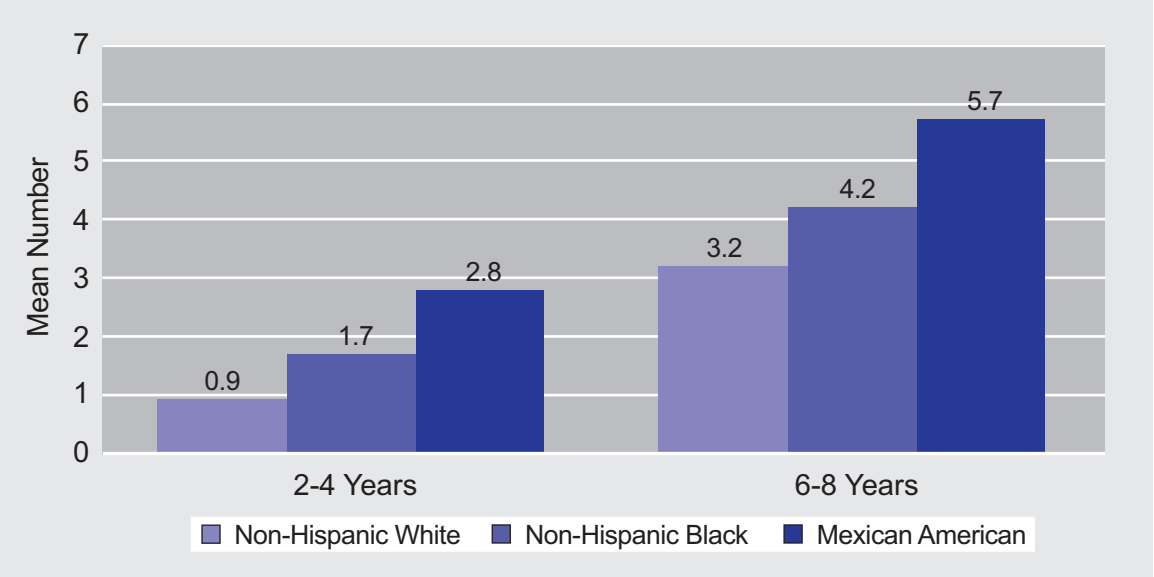
Data source: The Third National Health and Nutrition Examination Survey (NHANES III) 1988-1994, National Center for Health Statistics, Centers for Disease Control and Prevention.

Figure 1.2.4. Decayed and filled surfaces in primary teeth (dfs) by age group (ages 2-4 and 6-8 years) and gender



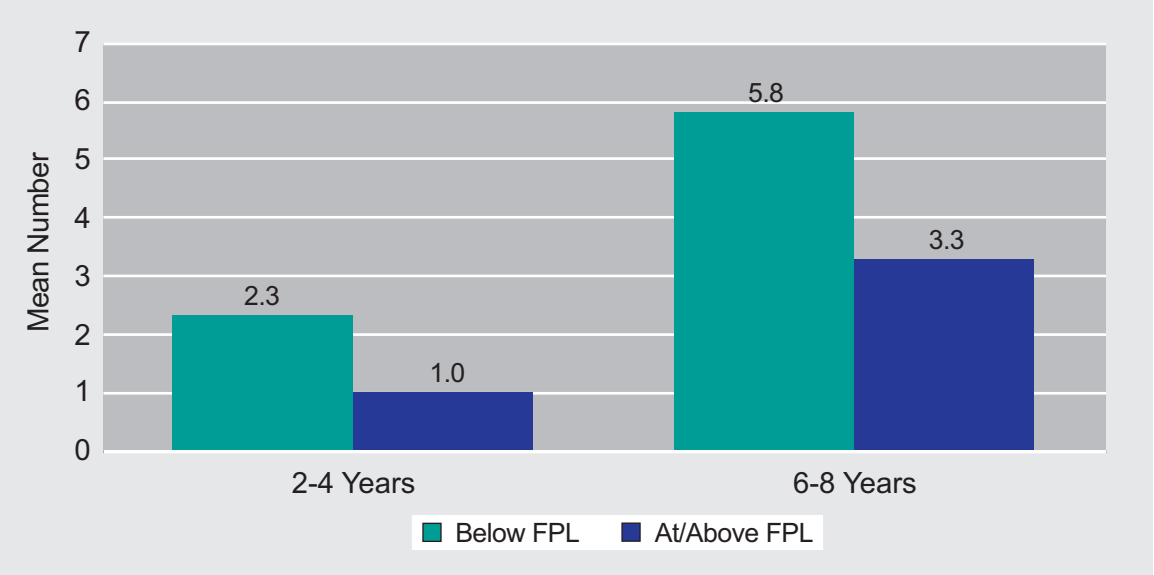
Data source: The Third National Health and Nutrition Examination Survey (NHANES III) 1988-1994, National Center for Health Statistics, Centers for Disease Control and Prevention.

Figure 1.2.5. Decayed and filled surfaces in primary teeth (dfs) by age group (ages 2-4 and 6-8 years) and race/ethnicity



Data source: The Third National Health and Nutrition Examination Survey (NHANES III) 1988-1994, National Center for Health Statistics, Centers for Disease Control and Prevention.

Figure 1.2.6. Decayed and filled surfaces in primary teeth (dfs) by age group (ages 2-4 and 6-8 years) and federal poverty level (FPL)



Data source: The Third National Health and Nutrition Examination Survey (NHANES III) 1988-1994, National Center for Health Statistics, Centers for Disease Control and Prevention.

1.3 Trends in the prevalence of untreated dental caries among children (2-4 and 6-8 years old), adolescents (12-15 years old), and adults (35-44 years old)

Overall, the proportion of children with untreated dental caries in the primary and permanent dentition has declined since the 1970s for all age, gender, race, and poverty level subgroups although differences among these groups remain (Brown et al., 1999; Brown et al., 2000). There have been continuing reductions in dental caries in permanent teeth among children and adolescents over the past few decades, yet caries prevalence in the primary dentition may have stabilized or increased slightly in some population groups (Petersson & Bratthall 1996; Rozier, 1995). Trends are displayed separately for primary and permanent dentitions.

The prevalence of untreated caries in primary dentition decreased from 48.7% in the 1970s to 26.5% in the 1990s among children aged 6-8 years. The prevalence of untreated dental caries in permanent dentition also decreased from NHANES I (1971-1975) to NHANES III (1988-1994) for ages 6-8 years (21.0 % to 6.3%), 12-15 years (53.2% to 16.9%), and 35-44 years (40.3% to 26.1%).

SOURCES OF DATA

Analyses reported here are based on the First and Third National Health and Nutrition Examination Surveys (NHANES I: 1971-1975 and NHANES III: 1988-1994), National Center for Health Statistics, Centers for Disease Control and Prevention.

Demographic differences in trends in untreated dental caries in primary dentition

- The prevalence of untreated dental caries in primary dentition has decreased since the 1970s among 6- to 8-year-olds. Among 2- to 4-year-olds, the change was negligible (Figure 1.3.1A).
- No gender differences were observed (Figure 1.3.1B).
- Among 6- to 8-year-olds, decreases were observed for all racial/ethnic groups. Among 2- to 4-year-olds, the decrease was only found among non-Hispanic whites (Figure 1.3.1C).
- Among 6- to 8-year-olds, the prevalence decreased for both federal poverty level groups. However, among 2- to 4-year-olds, there was an increase in prevalence for children living below the federal poverty level and a decrease for those living above the federal poverty level (Figure 1.3.1D).

Demographic differences in trends in untreated dental caries in permanent dentition

- Prevalence of untreated dental caries decreased in all three age groups (Figure 1.3.2A).
- No differences were observed by gender (Figure 1.3.2B).
- Prevalence of untreated dental caries decreased in all age and racial/ethnic groups except non-Hispanic blacks 35-44 years old who had a negligible increase (Figure 1.3.2C).
- Prevalence of untreated dental caries decreased in all three age groups regardless of whether individuals were living below or at/above the federal poverty level (Figure 1.3.2D).

Bullets reference data that can be found in Table 1.3.1.

REFERENCES

Brown LJ, Wall TP, Lazar V. Trends in untreated caries in permanent teeth of children 6 to 18 years old. J Am Dent Assoc 1999;130(2):1637-44.

Brown LJ, Wall TP, Lazar V. Trends in untreated caries in primary teeth of children 2 to 10 years old. J Am Dent Assoc 2000;131(2):93-100.

Petersson HG, Bratthall D. The caries decline: a review of reviews. Eur J Oral Sci 1996;104:436-43.

Rozier RG. The impact of recent changes in the epidemiology of dental caries on guidelines for the use of dental sealants: epidemiologic perspectives. J Public Health Dent 1995;55(SI):292-301.

Figure 1.3.1A. Trends in primary dentition untreated dental caries prevalence by age group

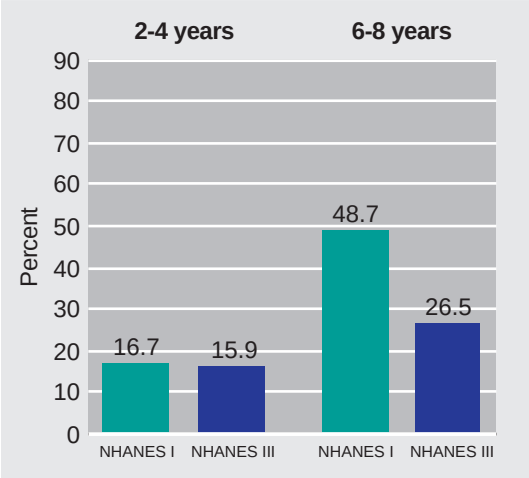


Figure 1.3.1B. Trends in primary dentition untreated dental caries prevalence by age group and gender

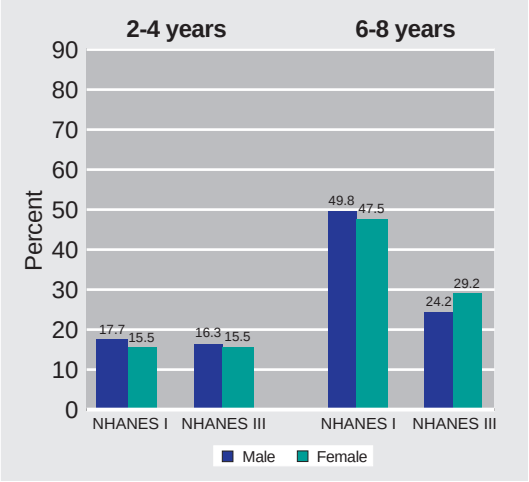
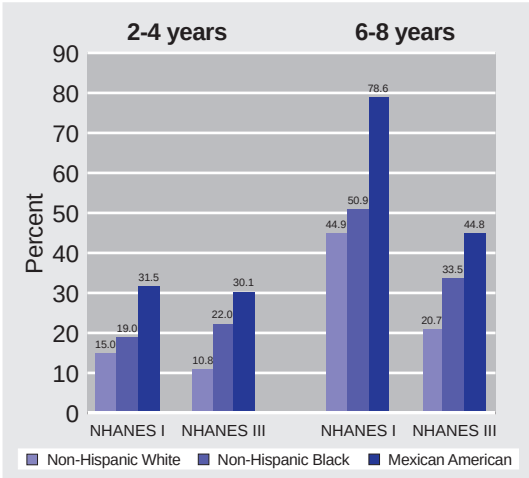
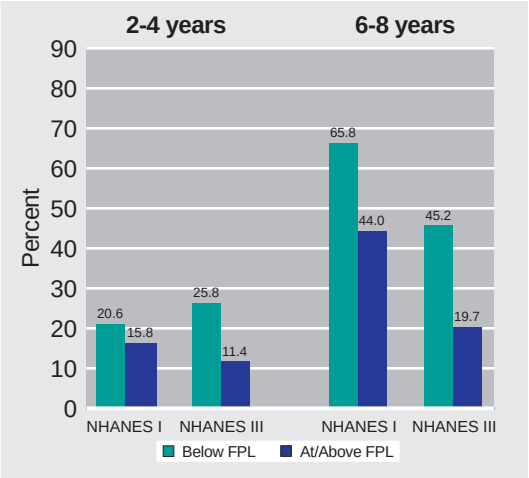


Figure 1.3.1C. Trends in primary dentition untreated dental caries prevalence by age group and race/ethnicity



Note: Race/ethnicity in NHANES I was coded to be comparable to NHANES III.

Figure 1.3.1D. Trends in primary dentition untreated dental caries prevalence by age group and federal poverty level (FPL)



Data sources: The First National Health and Nutrition Examination Survey (NHANES I) 1971-1975, and the Third National Health and Nutrition Examination Survey (NHANES III) 1988-1994, National Center for Health Statistics, Centers for Disease Control and Prevention.

Figure 1.3.2A. Trends in permanent dentition untreated dental caries prevalence by age group

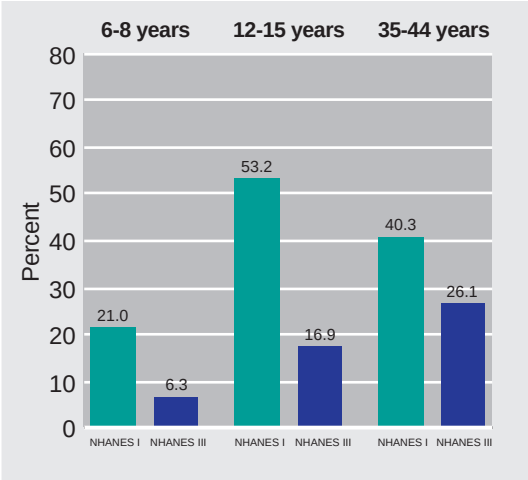


Figure 1.3.2B. Trends in permanent dentition untreated dental caries prevalence by age group and gender

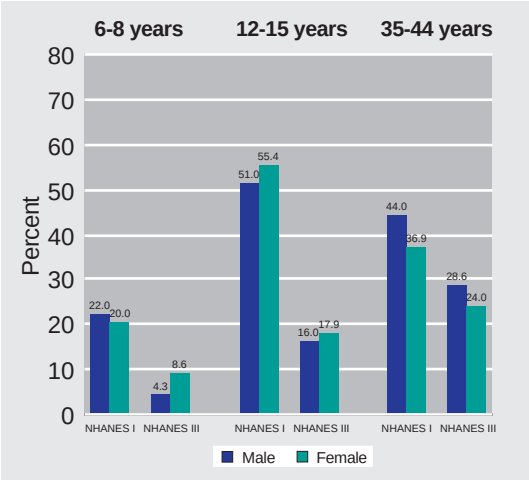


Figure 1.3.2C. Trends in permanent dentition untreated dental caries prevalence by age group and race/ethnicity

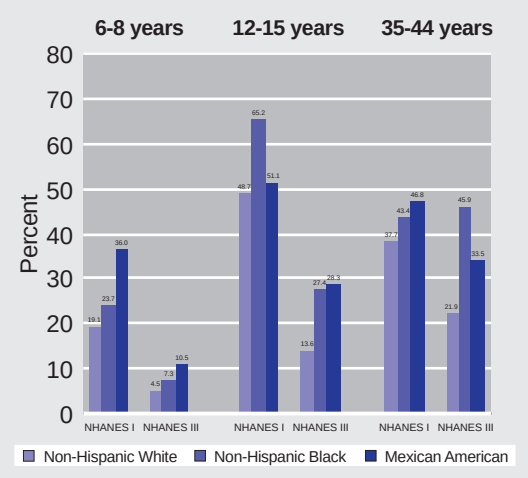
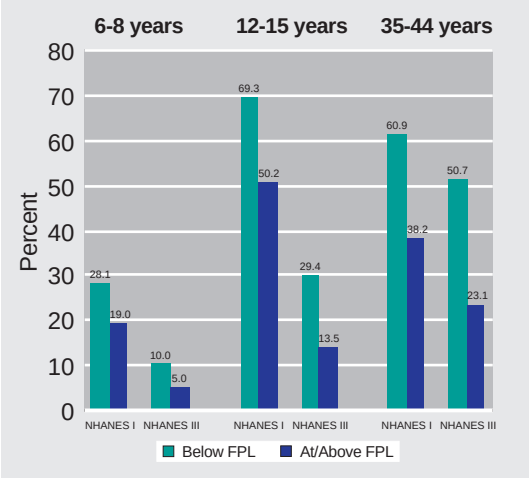


Figure 1.3.2D. Trends in permanent dentition untreated dental caries prevalence by age group and federal poverty level (FPL)



Data sources: The First National Health and Nutrition Examination Survey (NHANES I) 1971-1975, and the Third National Health and Nutrition Examination Survey (NHANES III) 1988-1994, National Center for Health Statistics, Centers for Disease Control and Prevention.